

## PATENT ABSTRACTS OF JAPAN

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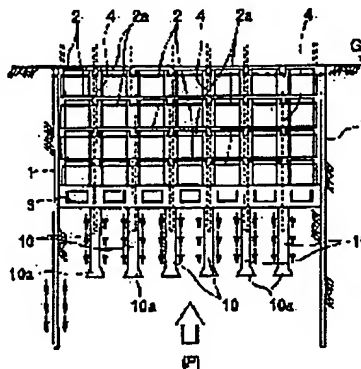
(21) Application number : 06-134161 (71) Applicant : OHBAYASHI CORP  
 (22) Date of filing : 16.06.1994 (72) Inventor : NAGATA KANJI  
 KAMINAGA KENICHI  
 NAKAHARA NORITO  
 TSUJI YASUHIKO

## (54) FOUNDATION STRUCTURE OF UNDERGROUND STRUCTURE

## (57) Abstract:

PURPOSE: To use a temporary foundation of a conventional inverted support as a permanent foundation so that a sufficient pull-out resistance, which can overcome buoyant forces, is given to the foundation.

CONSTITUTION: In a foundation structure of an underground structure wherein concrete floor slabs 2 are constructed in multilayers successively from above by an inverted construction method while the ground surrounded by an earth retaining wall 1 is being excavated and the slabs 2 are supported by a plurality of temporary inverted support 4, a foundation is constructed as a permanent foundation 10 by excavating the ground under a location where an inverted support 4 is installed. At first, a hole is excavated to a depth deeper than a predetermined depth of construction of a bottom plate 3. And the deepest section of the hole is formed into a trapezoidal shape. After completion of excavation work, concrete is placed to a predetermined depth for the plate 3, so that the permanent foundation 10 wherein a trapezoidal bottom portion 10a is integral with the lower part of the foundation is constructed.



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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the raft foundation structure of the substructure which gave sufficient resistance force to the buoyancy which joins especially this substructure in the substructure which strikes and is built by the method of construction conversely.

[0002]

[Description of the Prior Art] It is the method of construction which advances construction to the lower portion one by one conversely, a method of construction building the floor system concrete of the structure of \*\*\*\* one by one from the upper part in connection with excavation by striking, and supporting \*\*\*\*\* by making this into timbering, and when building a substructure especially with deep underground depth, it excels in the field of the time necessary for completion and safety.

[0003] The floor system concrete 2 with which drawing 3 carried out [ the interior which shows the conventional substructure which struck and was built by the method of construction, and was conversely enclosed by \*\*\*\*\* 1 ] the in-every-direction unification of the beam 2a in order from the upper part at the inferior surface of tongue is built multi-stage, and the base 3 is built by the deepest section.

[0004] the temporary construction of a large number beforehand built in the perpendicular direction in the foundation of each floor system concrete 2 is reverse -- it strikes and is supported by the support 4 Moreover, it strikes conversely, and the soffit of a support 4 is united with the temporary foundation 5 by concrete etc., thereby, it strikes conversely and the support proof stress of a support 4 is obtained.

[0005]

[Problem(s) to be Solved by the Invention] Greatly [ the capacity scale ], when a ground water level is high, water pressure P always acts on the substructure of the above composition up, and a huge buoyancy acts on it. Then, the weight is made to oppose increase and buoyancy at the former by driven in and drawing out much permanent support 6 in the lower part of a base 3, and \*\*\*\*\* (ing) concrete 7 to a part for the centrum of the base 3 upper part [ \*\*\*\* / considering as a resistor ].

[0006] However, in the former, the time necessary for completion was prolonged by all by needing the amount of concrete great in the latter by construction trouble starting mostly, and it was uneconomical from the field of the cost of construction and materials.

[0007] Made in order that this invention may solve the above problem, the purpose offers the basic structure of the substructure which gave sufficient drawing resistance which is the former, and which strikes conversely, sets the temporary foundation of a support as the foundation of \*\*\*\*, and overcomes buoyancy at the foundation.

[0008]

[Means for Solving the Problem] While striking conversely and building floor system concrete to multi-stage sequentially from the upper part by the method of construction, this invention excavating the foundation enclosed by \*\*\*\*\* in order to attain the aforementioned purpose In order to increase the drawing resistance which overcomes this floor system concrete at buoyancy in the substructure which are two or more temporary construction, and which strikes conversely

and was supported with the support, while striking conversely and forming [ above-mentioned ] the \*\*\*\* foundation of a support deeply, it is characterized by expanding the bottom of and forming the foundation-bed section.

[0009]

[Function] According to the above composition, it strikes conversely and a support builds, according to a lump number, the foundation-bed section expands the bottom, the \*\*\*\* foundation is formed deeply, and sufficient drawing resistance force is acquired to the buoyancy which is temporary construction and which acts on a substructure by the anchor effect of this portion.

[0010] moreover, reverse until a base is completed since it can strike conversely and the support proof stress of a support can be secured greatly -- striking -- the support intensity of a support -- enough -- \*\* -- it becomes

[0011]

[Example] Hereafter, one example of this invention is explained in detail, referring to drawing. Drawing 1 shows the whole substructure composition of the multilayer structure concerning this invention. In addition, in drawing, the same sign is explained to the same part as the former using the sign from which it gives and only a different part differs.

[0012] That is, in this example, the floor system concrete 2 which struck to the interior enclosed by \*\*\*\*\* 1 conversely, and carried out the in-every-direction unification of the beam 2a from the upper part on the inferior surface of tongue at order using the support 4 is built by multi-stage, and the concrete base 3 is built by the deepest section.

[0013] the temporary construction of a large number beforehand built in the perpendicular direction in the foundation of each floor system concrete 2 is reverse -- it strikes and is supported by the support 4 Moreover, it strikes conversely [ each ], and this strikes the lower part of a support 4 conversely by uniting with the \*\*\*\* foundation 10 concerning this invention, and the support proof stress of a support 4 is obtained. The upper part of the \*\*\*\* foundation 10 is united with a base 3.

[0014] Next, a construction procedure is explained according to drawing 2 . First, although the hole for building a part for a pillar section will be excavated from earth surface, it excavates with the earth drill etc., pouring in slurry, such as a bentonite, on the occasion of this, so that the hole concerned may not collapse. And further, if it is in this invention, as shown in drawing 2 (a), the digging hole 12 is investigated to depth still deeper than the construction schedule depth D of a base 3, and, subsequently to a trapezoidal shape, the bottom of the deepest section of the digging hole 12 is expanded. As the formation method of this bottom expansion section 10a, the bucket 100 of a special configuration currently indicated by JP,3-71527,B, for example is adopted. As it expands to a part of drawing 2 (a) and was shown, after this bucket's 100 having the feature to which the maximum width of an aperture position serves as size from the maximum width of a stoppage position and excavating a hole to schedule depth first, bottom expansion section 10a of a trapezoidal shape will be formed by opening in the deepest section and shaving off a digging wall surface with the maximum width of a position.

[0015] After digging work is completed, as shown in drawing 2 (b), the \*\*\*\* foundation 10 by which bottom expansion section 10a of a trapezoidal shape was united with the lower part will be built by striking conversely, setting up a support (steel frame) 4 from earth surface, and subsequently placing concrete to the construction schedule depth D of a base 3 so that the setting-depth suitable in concrete may be obtained. And this \*\*\*\* foundation 10 is built to sufficiently deep depth compared with the conventional temporary foundation, and also has the function to which strike conversely [ aforementioned ] conjointly with the increase in area of bottom expansion section 10a, and the increase in a weight, and the support proof stress of a support 4 is made to increase further.

[0016] Then, the \*\*\*\* foundation 10 is united with this base 3 by building the floor system concrete 2 to multi-stage sequentially from the upper part, excavating the interior enclosed by \*\*\*\*\* 1, and finally building the base 3 of the deepest section, as shown in drawing 2 (c).

[0017] If the buoyancy by water pressure P acts on the substructure of the above composition, the frictional force for a shank of each \*\*\*\* foundation 10 and sufficient drawing resistance to which

the bottom expansion section 10a becomes support, and overcomes buoyancy arise, and a substructure can be fixed in the foundation, without requiring permanent support or \*\*\*\*\* concrete.

[0018]

[Effect of the Invention] If it is in the basic structure of the substructure by this invention as the example explained in detail above Conversely Since sufficient drawing resistance force is acquired to the buoyancy which it strikes and a support builds, the foundation-bed section expands the bottom, and the \*\*\*\*\* foundation is deeply formed according to a lump number, and acts on a substructure by the anchor effect of this portion, It can be based neither on construction of permanent support, nor placing of \*\*\*\*\* concrete like before, but a substructure can be fixed in the earth, and shortening of the time necessary for completion, cost-of-construction reduction, and the futility of materials can be excluded.

[0019] Moreover, by the increase and the increase in a weight of the \*\*\*\*\* foundation in bottom expansion area, it strikes conversely and there are also the support intensity of a support and the advantage acquired enough which it is conversely until it can strike, it can secure the support proof stress of a support greatly and a base is completed.

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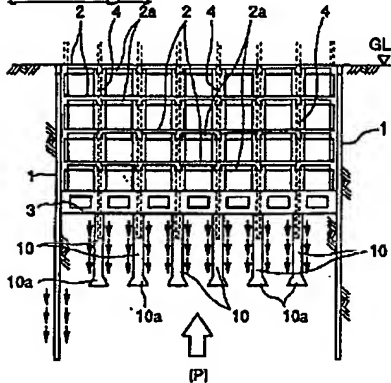
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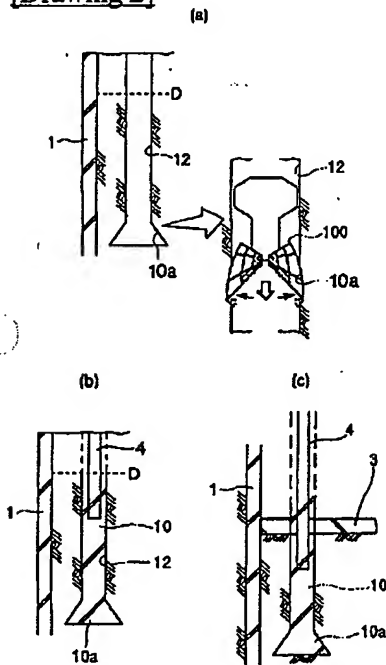
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## DRAWINGS

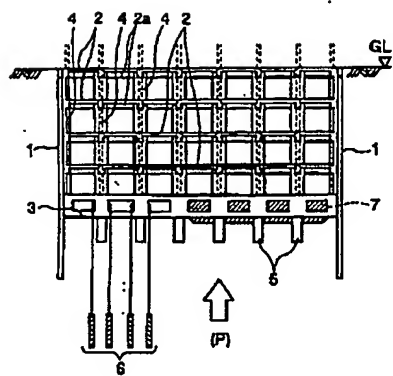
[Drawing 1]



[Drawing 2]



[Drawing 3]



[Translation done.]

Mat foundation structure of underground construction object e.g. wither shin - installs base parts, by digging out deeper excavation holes than scheduled constructional depth

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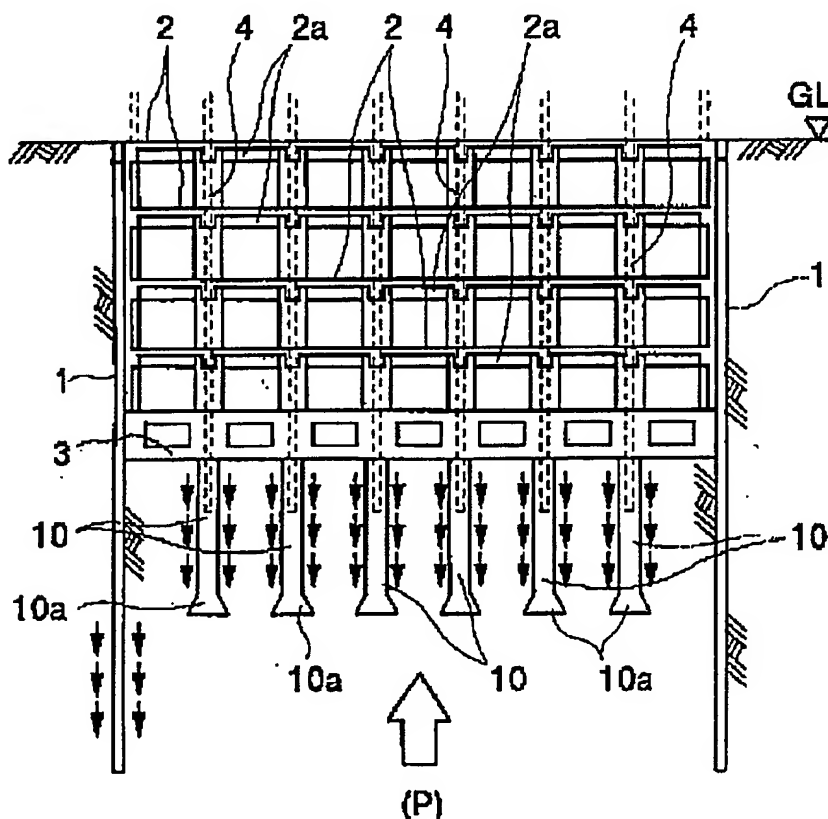
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The structure applies concrete floor version (2) in stepwise fashion employing strike method into a dugout pit. The pit is enclosed by a set of earth retaining walls (1) which provide support to the concrete floor slabs by means of multiple strike props (4). Digging is carried out for installation of base parts (10) beneath the strike prop installation positions.

For installation of the base, first an excavation hole, reaching beyond construction floor version scheduled depth (3) is done. Then, a trapezoidal part (10) is formed at the lower most end of the excavation hole. The base along with its trapezoidal tip (10a) is integrated with the excavation hole.

USE/ADVANTAGE - Is used as temporary housing base. Reduces work term. Overcomes buoyancy of base by imparting sufficient extraction resistance. (4pp DQ.No.1/3)

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